

Purpose of Health Impacts Analysis

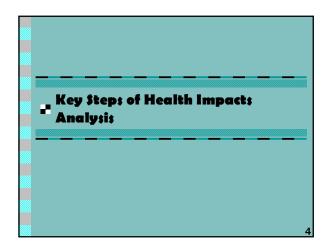
- Administration's Goods Movement Action Plan
- Community health and environmental justice
- ARB's Diesel Risk Reduction Plan
- Air quality standards and plans (SIPs)

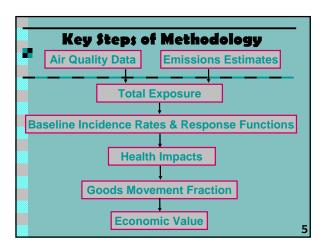
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Nature of the Problem

- Existing emissions impacts, especially near ports, rail yards, high traffic corridors
- Growth in international trade and goods movement in general
 - Goods movement contributes more than \$200 billion/year to California's economy
- "Legacy" fleets of diesel engines needing controls or replacement

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	Air Pollutant; Included	_
	Particulate matter (PM)	
	- Diesel PM	
	-Nitrates (NOx) and sulfates* (SOx) that form particles	
-	Ozone	
	-From NOx and reactive organics (ROG)	
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	*Not yet included in goods movement analyses	6

Methodology

- Developed and used by U.S. EPA
 - -Benefit-to-cost ratio of Clean Air Act
 - -Diesel regulatory impact analysis
- Used by ARB/OEHHA for State ambient air quality standards for PM and Ozone
- Used by ARB for diesel PM control measures and Goods Movement
- Endorsed by NAS, WHO, and others

Sources of Information

- Substantial body of evidence
 - Scientific peer-reviewed journals
 - National and international studies
- ARB's 2002 PM standards review
- ARB's 2005 ozone standard review
- U.S. EPA's PM standard review

Health Endpoints Considered

- Mortality (all-cause, cardiopulmonary, lung cancer, infant)
 Hospital admissions (pulmonary, COPD, pneumonia, asthma, cardiovascular, ER visits)
- Heart attacks
- Bronchitis (chronic and acute)
- Lower respiratory symptoms (asthma and others)
- Minor restricted activity days and work loss days
- School absences
- Low birth weight and pre-term birth
- Exacerbation of asthma
- Asthma attacks and asthma onset
- Decreased lung function growth
- Neurotoxicity, psychological factors (stress), and developmental effects
- Noise (including cardiovascular effects)
- Quality of life

Health Endpoints Quantified Plan recognizes over 20 discrete health endpoints from PM and ozone exposure Staff sought sufficient evidence to quantify 8 outcomes now quantified, including some combined endpoints (all-cause mortality, asthma and respiratory effects) Remaining endpoints are addressed qualitatively

PM and Premature Death

- American Cancer Society study (~500,000 adults, 1982-1998)
 - -For PM2.5, over 300,000 adults in 51 cities
 - -Pope (2002) analysis
- Jerrett (2005) analysis for Los Angeles
 - -About 23,000 adults
 - -PM2.5 in 2000 from 23 monitors interpolated for each zip code

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- Results

2005 Health Impacts Quantified from Goods Movement Cases/Year Premature death* 2,400 Hospital admissions (heart) 830 Hospital admissions (lung) 2,000 Acute bronchitis 5,100 Asthma/other respiratory symptoms 62,000 Work loss days 360,000 Minor restricted activity days 3.9 million School absence days 1.1 million *Uncertainty range is 720 to 4,100 deaths/year

(~1,200 premature deaths /µg PM2.5)

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Conclusions

- Plan uses best available information on impacts of air pollution on health
- PM is the pollutant of greatest concern
- Goods movement accounts for a substantial fraction of the total health impacts

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■ Next Steps

- Public process to update PM-premature death relationship on-going
 - Develop best method to incorporate other PM studies into premature death analyses
 - New factor based on U.S. EPA's Expert Elicitation for PM
 - Draft ARB report December, followed by public and peer review
- Sulfate impacts to be based on SOx Emission Control Area (SECA) analysis

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